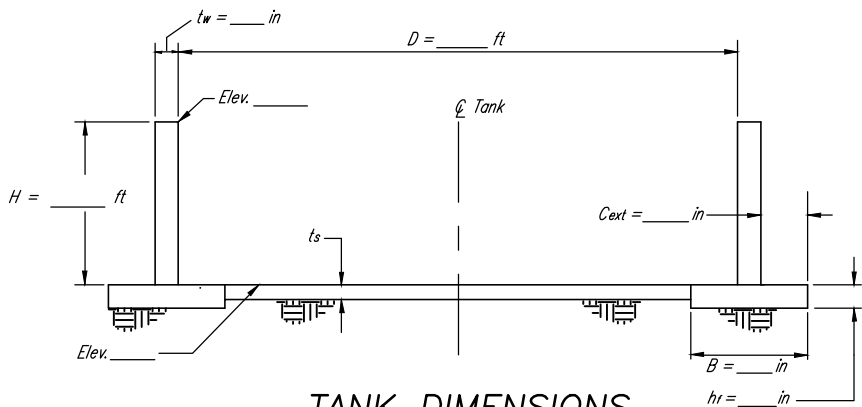
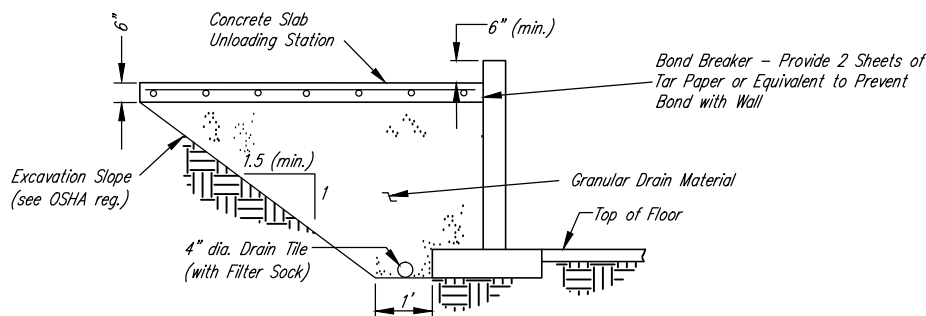


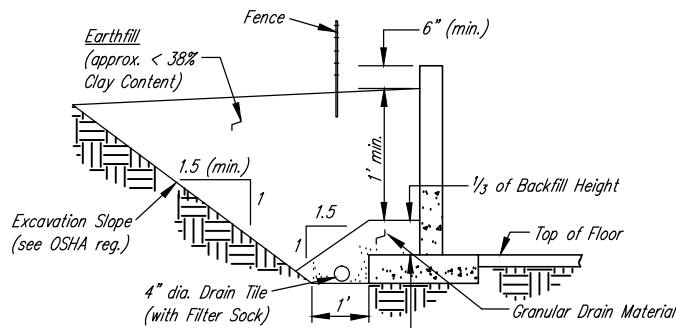
CIRCULAR CONCRETE MANURE TANK



TANK DIMENSIONS

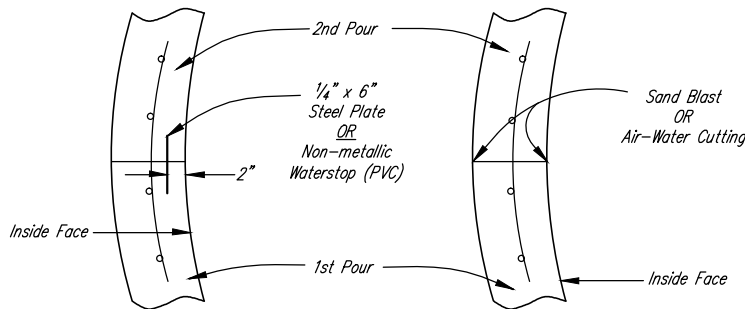


WALL BACKFILL DETAIL-UNLOADING STATION



WALL BACKFILL DETAIL-TYPICAL

1. Provide a minimum 4-inch diameter perimeter drain tile for wall backfill drainage. Outlet the tile at a location downstream where flow from the outlet may be monitored.
2. If a high water table is present, a special drain design will be required under the tank floor to prevent uplift.
3. To provide adequate drainage, the granular drain material shall be clean with maximum 5 percent fines. The maximum particle size shall be 1.5 inches.



ALTERNATIVE 1

ALTERNATIVE 2

PLAN VIEW TYPICAL WALL JOINT DETAIL

ESTIMATED QUANTITIES

<u>ITEM</u>	<u>AMOUNT</u>	<u>UNITS</u>			
EXCAVATION	_____	CU. YD.			
SUBGRADE FILL	_____	CU. YD.			
BACKFILL	_____	CU. YD.			
DRAINFILL	_____	CU. YD.			
DRAIN TILE	_____	LIN. FT.			
FENCING	_____	LIN. FT.			
SHEAR PLATE	_____	LIN. FT.			
CONCRETE CHAIRS	_____	EACH			
CURING COMPOUND	_____	GAL.			
_____	_____	_____			
<u>CONCRETE (4,000 psi)</u>					
Wall Footing _____ SQ. FT.	_____	CU. YD.			
Tank Floor Slab _____ SQ. FT.	_____	CU. YD.			
Wall _____ LIN. FT.	_____	CU. YD.			
Other: _____	_____	CU. YD.			
TOTAL CONCRETE _____		CU. YD.			
<u>STEEL REINFORCEMENT (Grade 60)</u>					
<u>Mark</u>	<u>Size</u>	<u>Spacing</u>	<u>Quantity</u>	<u>Length</u>	<u>Total Length</u>
As1	_____	_____	_____	_____	_____
As2	_____	_____	_____	_____	_____
Asv	_____	_____	_____	_____	_____
Asr	_____	_____	_____	_____	_____
Tie Bars	_____	_____	_____	_____	_____
TOTAL #4 BARS (excluding floor)=			_____ FEET	_____	LBS.
TOTAL #5 BARS (excluding floor)=			_____ FEET	_____	LBS.
<u>FLOOR STEEL (Grade 60)</u>					
<u>Mark</u>	<u>Size</u>	<u>Spacing</u>	<u>Quantity</u>	<u>Total Length</u>	<u>Weight (lb.)</u>
Floor	_____	_____	_____	_____	_____

This drawing is based on a design prepared by the MidWest Plan Service (MWPS) at Iowa State University. For more specific details concerning the design refer to MidWest Plan Service Publication TR-9, Circular Concrete Manure Tanks (March 1998). This drawing may be used for tanks which are above or below ground. The original design was in accordance with ultimate strength design requirements detailed in ACI 318-95.

Design Loading:

1. Manure load: 65 psf/ft. of depth
2. Soil backfill loads: 85 psf/ft. of depth with no surcharge or 60 psf/ft. of depth with 120 psf lateral surcharge. This requires the structure backfill to be adequately drained. To meet this requirement see backfill details on this sheet.

Construction Notes:

1. Reinforcing steel for footings, walls, and floor shall have a tension yield point of $f_y = 60,000$ psi (Grade 60 steel).
2. For splice lengths, refer to the Table on Sheet 2. All bends in reinforcing steel shall have a minimum inside radius of 3 bar diameters.
3. All concrete shall have a minimum 28 day compressive strength of 4,000 psi. The mix design shall be submitted to NRCS prior to placement. Unless shown otherwise in the construction specifications, the following requirements shall apply:
 - Minimum cement content- 6 bags per Cu. Yd.
 - Maximum water to cement ratio (w/c)- 0.50
 - Slump- 4 inches plus or minus 1 inch
 - Air content from 4 to 8 percent
 - Aggregate size- maximum of 1 inch diameter
 - Construction joints- cleaned prior to subsequent concrete placement
 - Cure concrete for a minimum of 7 days. Acceptable methods are: membrane forming curing compound, soaking/continuous spray
4. Construction joints may be used to ease construction. The location of construction joints shall be approved by the Engineer prior to placing the concrete.
5. The 1/4" x 6" steel plate in the wall to ring foundation joint shall be continuous. Steel plate sections may be butt welded or lapped & bolted with a minimum lap length of 12 inches to make them continuous.
6. Refer to manufacturer's recommendation for placing waterstop material.
7. Backfill shall be brought up uniformly around the tank. The maximum difference in the finished backfill elevations around the tank shall be 3 feet.
8. All construction methods shall meet OSHA regulations.
9. See Section 302, MWPS 1, "Foundations for Farm Structures", Revised 1987, for tanks with backfill less than frost depth (Section 901, MWPS 1).
10. Installation of this structure shall conform to the current version of the NRCS-Ohio Design and Construction Specification "Concrete".

Safety Considerations:

1. The tank shall be surrounded by a chain link or woven wire fence.
2. Posts shall not be cast into the concrete wall.
3. Safety stops shall be installed at push-off locations to prevent accidental entry of equipment.
4. Warning signs shall be erected around the tank stating that entry may result in injury or death.

Unloading Station:

If tractors, heavy tank wagons, or trucks will be driven along the edge of the tank, cast a 6-inch thick concrete slab along the traffic route by the tank. The concrete slab should be large enough to eliminate any wheel loads directly on the natural ground or backfill by the tank. The purpose of the slab is to distribute the loading along the tank wall and prevent mud and erosion. The concrete slab should have Temperature & Shrinkage steel reinforcement equivalent to No. 4 bars at 18 inches C-C (steel shall be placed at or above the mid-depth of the slab). Granular backfill is required under slab.

Date _____

Designed _____

Drawn _____

Checked _____

Approved _____

County, Ohio _____

CIRCULAR CONCRETE MANURE TANK

Plan, Construction Notes & Quantities

Location- _____

United States Department of Agriculture

USDA

Natural Resources Conservation Service

File No. _____

Drawing No. OH-N-506-CAD

Sheet _____ of _____